

THE TUMOUR BANK BULLETIN

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KOLLING INSTITUTE

Discovery *into* Reality™



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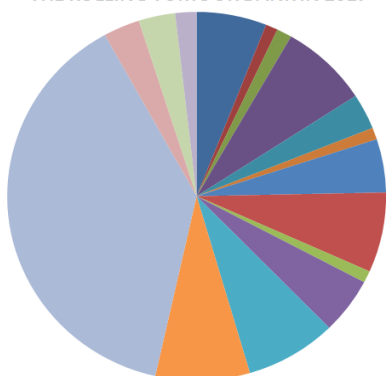
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Welcome to 2018 from all of us here at the Kolling Institute Tumour Bank! After a well earned break over Christmas and new year, we are back in full swing consenting patients willing to donate their cancer tissue for research, interacting with surgeons to collect these samples from operating theatres, and liaising with researchers on their new and exciting projects.

TYPES OF CANCER TISSUE DONATED TO THE KOLLING TUMOUR BANK IN 2017



■ Liver	■ Gastric
■ Oesophageal	■ Pancreas
■ Duodenum	■ Upper Gastro - Other
■ Endometrium	■ Ovary
■ Uterus	■ Gynae - Other
■ Adrenal	■ Endocrine
■ Brain	■ Nerve
■ Pituitary	■ Spine

Last year was a very successful one for the Kolling Institute Tumour Bank. Over 500 patients kindly agreed to donate excess cancer tissue not required by pathologists for their diagnosis, to form an integral part of medical research supported by the Kolling Tumour Bank. These generous patients also donated a small blood sample prior to their operation, and gave permission for relevant clinical data to be analysed by medical researchers.

Biospecimens collected by the team at the Kolling Institute Tumour Bank represent a wide variety of tissue types, as demonstrated in the graph seen left. Each year our team works tirelessly to add to the growing repository of tissue and blood samples that support cancer research. Our aim for 2018 is to continue to develop this valuable resource of high quality samples.



Mikaela Holmes
Tumour Bank Officer



THE UNIVERSITY OF
SYDNEY



The Royal North
Shore Hospital

ANATOMICAL PATHOLOGY AND BIOBANKING - STRENGTHENING RELATIONSHIPS

Anatomical Pathology is a branch of diagnostic medicine that plays a vital role in diagnosing and characterising cancer and other diseased states in tissue. It is often the foundation upon which major clinical decisions are made, such as surgery or radiation.

Biobanks, or in our case specifically tumour banks, collect and store both cancer and normal tissue samples, along with associated clinical data. These biospecimens can be accessed by medical researchers who have had their projects approved by a Human Research Ethics Committee.

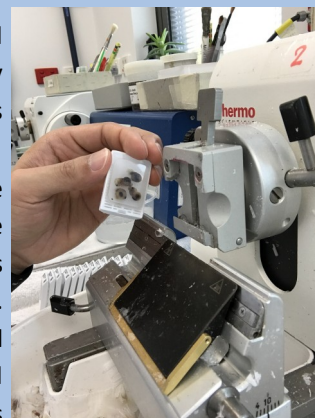


Sam filing tissue blocks in the Anatomical Pathology department

These two arms of medical science, diagnostic and research, have always held a close association with one another. Developments made through research feed into clinical care, which in turn provides researchers with new impetus and direction for areas of investigation. Strengthening this relationship between research and clinical pathology is a priority of both the Office of Health and Medical Research (OHMR) and NSW Health Pathology (NSWHP). NSWHP holds a specific interest in streamlining current practices in biobanking for research purposes.

In 2016 the Kolling Institute Tumour Bank (KITB) together with Royal North Shore Hospital (RNSH) won a competitive bid for \$100,000 to be one of two NSW sites taking part in a pilot of proposed changes to the way biobanking for research is conducted in NSW hospitals.

This pilot aims to collect and analyse data necessary to recommend embedding biobanking into NSWHP. Here at KITB/RNSH, the project is being lead by Sam Yuen (pictured left) who is acting as a liaison between the KITB and the RNSH Anatomical Pathology department. He is carrying out the project in three phases, consisting of data collection, a trial period of embedding biobanking into Pathology, and analysis of the information gathered.



Creating slides from a paraffin block of tissue using a microtome

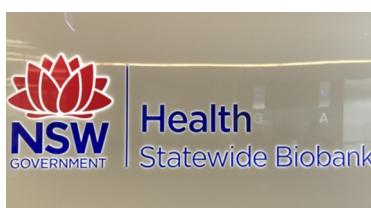
KOLLING BIOBANKERS VISIT THE NSW HEALTH STATEWIDE BIOBANK

The new year is shaping up to be an exciting one for biobanking in NSW, with the official opening of the NSW Health Statewide Biobank at the Professor Marie Bashir Centre at Royal Prince Alfred Hospital in late 2017. Over 3 million biospecimens including tissue, blood and tumour cells collected from consented patients across NSW will be stored in the Camperdown facility, making it the biggest biobank in the southern hemisphere.



The Kolling Institute Tumour Bank team were treated to a behind-the-scenes tour of the NSW Health Statewide Biobank back in November. With space increasingly becoming an issue at our current Royal North Shore Hospital site, the Statewide Biobank may represent a viable solution to this, with older or less frequently accessed biospecimens potentially being moved to the new facility.

A \$12 million collaboration between the Office of Health and Medical Research, NSW Health Pathology, Sydney Local Health District and Health Infrastructure, this state-of-the-art storage facility with sample preparation and processing laboratories will be an invaluable resource for researchers from across all divisions of healthcare. Centralising biospecimens in one location, together with the automated technology used to manage and retrieve the donated samples offers new opportunities for biobanking in NSW. This may help speed up the time taken for discoveries made in the laboratory to evolve into real-world clinical therapies for patients.



If you would like more information about the NSW Health Statewide Biobank head to:

biobank.health.nsw.gov.au

Investigating how genetic changes may be involved in the spread of cancers of the adrenal gland



Patient donated tumours are invaluable for understanding the mechanisms of cancer.

Our group has been studying specific adrenal tumours, known as pheochromocytomas and paragangliomas. Although these tumours are rare, they are associated with a high level of disease and poor quality of life. Cells from these tumours are capable of spreading (metastasising) to other sites, such as bone, lungs, lymph nodes and liver. As there are currently no highly effective treatments for individuals who develop metastatic disease, their long term survival is limited (with only one in every two patients surviving beyond five years).

Our current understanding of how and why these tumour cells spread to other sites is limited, which means it is extremely difficult to predict if, or even when, metastatic disease is likely to occur in any individual who develops these tumours. This causes considerable anxiety for both patients and their families, watching and waiting for metastatic disease that may never develop. It also makes clinical management extremely difficult and lifelong surveillance, by way of biochemical testing and imaging,

is required. The identification of early markers of metastatic potential is a high priority.

One area of our research focuses on identifying genetic abnormalities that are unique to metastatic tumours. Recently our studies have focused on TERT, a gene which is normally expressed at very low levels in adult tissues. However, recent studies have shown that high levels of TERT have been observed in a number of cancer types, including pheochromocytomas and paragangliomas where approximately 25% exhibit abnormally high levels of TERT. The mechanism leading to TERT overexpression in pheochromocytomas and paragangliomas remains unclear. Our study was able to uncover, for the first time in this tumour type, one of the mechanisms responsible for TERT overexpression in a portion of metastatic pheochromocytomas. Through the use of a method known as “whole genome sequencing”, we identified chromosomal rearrangements that are responsible for TERT overexpression in a group of metastatic pheochromocytomas. These chromosomal rearrangements resulted in the placement of enhancer regions (that are capable of activating genes) near the TERT gene, resulting in TERT overexpression.

We hope our findings, combined with further studies, will lead to the identification of effective treatments that ultimately halt the spread of disease in individuals with pheochromocytoma and paraganglioma.

To read the scientific abstract of the paper published by Dr Trisha Dwight and team in *Endocrine-Related Cancer* head to:

<http://erc.endocrinology-journals.org/content/25/1/1.abstract>

Dr Trisha Dwight

Cancer Genetics Laboratory, Kolling Institute

Trisha has been involved in cancer research for over 20 years, starting as a research assistant in the Cancer Genetics Laboratory at the Kolling Institute before undertaking her PhD investigating the genetic changes of parathyroid tumours. She then spent a couple of years at the Karolinska Institutet in Sweden, home to the Nobel Prize in Physiology or Medicine, studying the genetic basis of thyroid tumours.

Following this, Trisha spent a number of years in the pharmaceutical industry as a scientific communicator before returning to laboratory-based research at the Kolling Institute. Trisha recently spent a year in Melbourne, working closely with collaborators at the Peter MacCallum Cancer Centre.

When not at work, you are likely to find Trisha outdoors – hiking, trail running, ocean swimming and competing in triathlons – and where possible combining these activities with fundraising for our early career cancer researchers via the Can Too Foundation.



Trish competing in an ocean swim to raise money for cancer research



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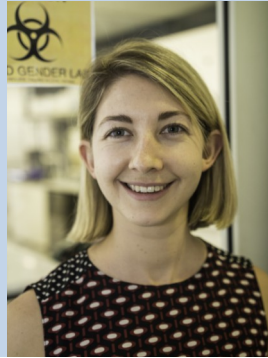
INTRODUCING THE KOLLING TUMOUR BANK TEAM



Ussha Pillai

Senior Tumour Bank Officer

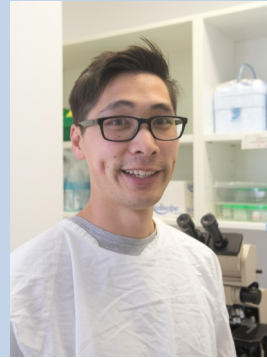
Ussha graduated from the University of Wollongong in 2001 with a Bachelor of Science. After university she started working for PaLMS Pathology at RNSH as a technical assistant before moving to the Kolling Institute Tumour Bank in 2006. What Ussha really enjoys about her job is that each day is different. Each person she meets has an interesting story to tell.



Mikaela Holmes

Tumour Bank Officer

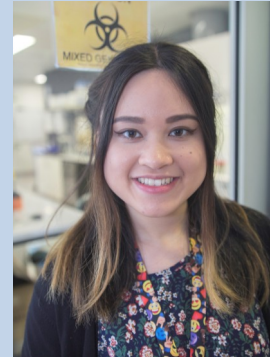
Mikaela attained a Bachelor of Biomedical Science from the University of Technology. Her career began in 2012 when she started working in Cytology at Concord Hospital. She relocated to London in 2015 and was employed in a laboratory at University College London. After traveling Europe, Mikaela returned to Sydney in late 2017 and joined the Kolling Tumour Bank soon thereafter.



Sam Yuen

NSW Health Pathology
Biobank Officer

Sam completed a Bachelor of Medical Science at Macquarie University and began working at the Bill Walsh Cancer Research Laboratory as a Research Assistant. His research focus was investigating biomarkers for early diagnosis of ovarian cancer. Since July 2017 Sam has been splitting his time between the Tumour Bank and RNSH Pathology.



Shannon Chan

Tumour Bank Laboratory
Assistant

Shannon graduated from the University of Wollongong with a Bachelor of Medical Bio-technology (Honours) in 2016. Her honours project involved investigating a particular subset of immune cells known as macrophages, and analysing their response when exposed to a *Streptococcus* infection. Shannon started working at the Kolling in July 2017.

Do you want to help us find a cure for cancer?

The University of Sydney's Kolling Institute of Medical Research located at Royal North Shore Hospital needs you to join us in the fight against cancer.

To help find a cure, we are analysing blood samples from cancer patients and comparing them with those from healthy volunteers.

We are looking for healthy volunteers who:

- Have not had cancer
- Have not donated to our banks before
- Are over the age of 18 (no upper age limit)
- Have not been hospitalised in the last 6 months

If you are interested in participating please contact us on **9926 4771** to arrange a time.



*This project has been approved by the Northern Sydney Local Health District Human Research Ethics Committee
Version 1. 3rd July 2014*

CONTACT US

Office: (02) 9926 4771

Hours: 8:30am-5:00pm

Website:

www.sydneyvital.org.au/biobank/



The Kolling Institute Tumour Bank relies solely on grants to build and maintain the collection of samples required to allow important medical research to continue. If you would like to make a donation to support the running of our tumour bank we would love to hear from you.

Please visit the **Sydney Vital** website and click on the 'Make a Donation' tab to complete our donation form.

www.sydneyvital.org.au/biobank